**1st American Conference on Human Vibration**
**Morgantown, West Virginia**
**June 5-7, 2006**

**Schedule of Events**
***Updated May 5, 2006***

**Sunday, June 4, 2006**

**7:30 -10:00 PM** Registration and Welcoming Reception

**Monday, June 5, 2006**

**8:00 – 8:45 AM** Registration

**8:45 – 9:00 AM** Opening remarks: Ren G. Dong, Ph.D., Health Effects Laboratory Division, National Institute for Occupational Safety and Health, Morgantown, WV, U.S.A.

**9:00 – 9:30 AM** Address: John Howard, M.D., M.P.H., J.D., LL.M., Director, National Institute for Occupational Safety and Health, Washington, D.C., U.S.A.

**9:30 – 10:20 AM** **Keynote lecture:** (Chairman: Dr. Ren G. Dong)
Health Effects of Vibration – The Known and the Unknown. Michael J. Griffin, Ph.D., Human Factors Research
Unit, Institute of Sound and Vibration Research, University of Southampton, Southampton, U.K.

**10:20 – 10:40 AM** **Coffee Break**

**10:40 – 12:10 PM** **Session 1: Exposure I** (Chairmen: Dr. Suhbash Rakheja and Dr. Logan Mullinix)

10:40 – 10:55 Using an air bladder seat shock isolation system to protect military vehicle occupants from mine blasts. Presented by D.D. Reynolds, University of Nevada, Las Vegas, Nevada, U.S.A.

10:55 – 11:10 Vibration spectral class characterization of long haul dump mining vehicles and seat performance evaluation. Presented by P.É. Boileau, Institut de Recherche Robert-Sauvé en Santé et en Sécurité du Travail, Montréal, Q.C., Canada

Notes: (1) Each keynote presentation includes 40 min. oral presentation and 10 min. question period; and (2) Each regular session presentation includes 10 min. oral presentation and 5 min. question period.

11:10 – 11:25 Time-frequency analysis of hand-transmitted vibration of impact tools using wavelet transform. Presented by: J. Kim, University of Cincinnati, Ohio, U.S.A.

11:25 – 11:40 Variation in the vibration emission of rotary hammer drills under simulated work-site conditions. Presented by N.J. Mansfield, Loughborough University, Loughborough U.K.

11:40 – 11:55 Device for measuring daylong vibration exposure and grip force levels during hand-tool use. Presented by D.R. Peterson, University of Connecticut Health Center, Farmington, Connecticut, U.S.A.

11:55 – 12:10 Challenges and uncertainties in measuring hand vibration in field studies. Presented by B. Evanhoff, Washington University School of Medicine, St. Louis, Missouri, U.S.A.

**12:10 – 1:10 PM** **Lunch at the Radisson**

**1:10 – 2:00 PM** **Keynote lecture:** (Chairman: Mr. Donald Wasserman)

Evaluation of whole-body vibration comfort.
Setsuo Maeda, Ph.D., National Institute of Industrial Health, Kawasaki, Japan and Neil J. Mansfield, Ph.D. Loughbrough University, Loughbrough, U.K.

**2:00 – 3:20 PM** **Session II: Health Effects I** (Chairmen: Dr. Suzanne Smith and Dr. Oliver Wirth)

2:00 – 2:15 Ride motion effects on the accuracy of rapid pointing tasks. Presented by K.A. Rider, University of Michigan, Ann Arbor, Michigan, U.S.A.

2:15 – 2:30 The effects of vibration on psychophysical grip and push force-recall accuracy. Presented by T.W. McDowell, National Institute for Occupational Safety and Health, Morgantown, West Virginia, U.S.A.

2:30 - 2:45 Comfort evaluation for mine shuttle car seat designs. Presented by A. Mayton, National Institute for Occupational Safety and Health, Pittsburgh, Pennsylvania, U.S.A.

2:45 – 3:00 A method of evaluating vehicle seat vibration with consideration of subjective judgment. Presented by Y. Nakashima, ISUZU Advance Engineering Center, Fujisawa, Japan.

3:00 – 3:15 Perception thresholds for lateral vibration at the hand, seat and foot. Presented by M. Morioka, University of Southampton, Southampton, U.K.

**3:15 – 3:30 PM** **Coffee Break**

**3:30 – 5:00 PM** **Session III: Biodynamics I** (Chairmen: Dr. Douglas Reynolds and and Dr. Farid Amirouche)

3:30 – 3:45 Pneumatic active suspension design for heavy vehicle seats and operator ride comfort. Presented by B. Valero, University of Illinois at Chicago, Chicago, Illinois, U.S.A.

3:45 – 4:00 Hand forces-dependent modeling of the hand-arm under $z_h$-axis vibration. Presented by Y. Aldien, Concordia University, Montréal, QC, Canada

4:00 – 4:15 Dynamic responses of a fingertip to vibration 3D finite element analysis. Presented by J. Wu, National Institute for Occupational Safety and Health, Morgantown, West Virginia, U.S.A.

4:15 – 4:30 Numerical models and hardware dummies for simulating whole-body vibration of human – An overview. Presented by H.P. Wölfel, Germany Darmstadt University of Technology, Darmstadt,

4:30 – 4:45 Simulation of human motion, muscle forces and lumbar spine stresses due to whole-body-vibration: An application of the dynamic human model CASIMIR for the development of commercial Vehicles and passenger cars. Presented by S. Pankoke, Wölfel Beratende Ingenieure GmbH + Co., Höchberg, Germany

4:45 – 5:00 A case study of whole-body vibration exposures associated with ordinary passenger and recreational vehicles. Presented by R.G. Gibson, BBN Technologies, Arlington, VA, U.S.A.

**6:00 – 7:30 PM** **Poster session and reception (See pages 10 – 11 for a list of Poster titles and presenters).** (Chairman: Dr. Kristine Krajnak)

**7:40 – 8:40 PM** **Committee meeting (Each member of the Scientific Committee and the Organizing Committee are required to attend this meeting)**

**Tuesday, June 6, 2006**

**8:00 – 8:50 AM** **Keynote lecture:** (Chairman: Dr. Martin Cherniack)
Some aspects of parthenogenesis of vibration-induced white finger. Hisataka Sakakibara, MD., Nagoya University School of Health Science, Nagoya, Japan

**8:50 – 10:20** **Session IV: Health Effects II** (Chairmen: Dr. Antony Brammer and Dr. Nabih Alem)

8:50 – 9:05 Prospective studies of vibration exposed cohorts: Hand-arm vibration International Consortium (HAVIC). Presented by M. Cherniack, University of Connecticut Health Center, Farmington, Connecticut, U.S.A.

9:05 – 9:20 Clinical Surveillance for HAVS. Presented by T. Jetzer,

9:20 – 9:35 Characteristic neuropathological changes in vibration injury: An experimental study. Presented by J.-G.Yan, Medical College of Wisconsin, Milwaukee, Wisconsin, U.S.A.

9:35 – 9:50 Measuring Physical and biochemical changes following long periods of work-related vibration. Presented by J.-G. Yan, Medical College of Wisconsin, Milwaukee, Wisconsin, U.S.A.

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9:50 – 10:05 Acute vibration exposure shifts the current perception threshold of Aβ fibers in a rat tail model of vibration. Presented by K. Krajnak, National Institute for Occupational Safety and Health, Morgantown, West Virginia, U.S.A.

10:05 – 10:20 Acute effects of vibration on rat-tail nerves. Presented by S. Govindaraju, Medical College of Wisconsin, Milwaukee, Wisconsin, U.S.A.

**10:20 – 10:40 AM Coffee Break**

**10:40 – 12:10 Session V: Health Effects III** (Chairmen: Dr. Thomas Jetzer and Dr. Danny Riley)

10:40 – 10:55 Seated human response to simple and complex impacts. Presented by T. Xia, University of Iowa Iowa City, Iowa, U.S.A.

10:55 – 11:10 Response to sudden load by patients with back pain. Presented by D. Wilder, University of Iowa, Iowa City, Iowa, U.S.A.

11:10 – 11:25 Upper body joint coordination under vibration Presented by B. Martin, University of Michigan, Ann Arbor, Michigan, U.S.A.

11:25 – 11:40 Effects of short-term exposure to whole-body vibration on wakefulness levels. Presented by Y. Satou, Kurume University School of Medicine, Kurume, Japan

11:40 – 11:55 Regional cerebral oxygenation and blood volume responses in healthy women during seated whole-body vibration (WBV). Presented by R.V. Maikala, Liberty Mutual Institute for Safety, Hopkinton, Massachusetts, U.S.A.

11:55 – 12:10 Health perception in workers exposed to hand-arm vibration: Prerequisite for putting in place an effective preventative program in the workplace. Presented by Alice, Turcot, Direction de Santé Publique Chaudière-Appalaches, Montreal, Canada

**12:10 – 1:10 PM** **Lunch at the Radisson**

**1:10 – 2:00 PM** **Keynote Lecture:** (Chairman: Dr. Thomas Armstrong)
European legislation and standardization for the control of risks from vibration at work. Chris Nelson, Ph.D., Health and Safety Executive, United Kingdom

**2: 00 – 3:30 PM** **Session VI: Epidemiology, Standards Applications, and Prevention I** (Chairmen: Dr. Bernard Martin and Dr. Paul-Emile Boileau)

2:00 – 2:15 Shock and impact on North American locomotives evaluated with ISO 2631 Parts 1 and 5. Presented by J.J. Gordon, GMH Engineering.

2:15 – 2:30 Revision of ANSI S3.34 (2.70-2006) – Guide for the measurement and evaluation of human exposure to vibration transmitted to the hand. Presented by D.D. Reynolds, University of Nevada – Las Vegas, Las Vegas, Nevada, U.S.A.

2:30 – 2:45 Standard tests for suspended seats – Can these contribute to protection against whole-body vibration? – Commentary on historical development and current work in CEN/TC231/WG9 (seating) Presented by R. Stayner, RMS Vibration Test Laboratory, Ludlow, U.K.

2:45 – 3:00 Evaluation of scraper operator exposure to whole-body vibration in the construction industry: A task analysis. Presented by E.K. Gillin, University of Western Ontario, Ontario, Canada.

3:00 – 3:15 Characteristics of whole-body vibration frequencies and low back pain in urban drivers. Presented by J.-C. Chen, University of North Carolina, Chapel Hill, North Carolina, U.S.A.

3:15 – 3:30 Investigation into the uncertainty in measurements and evaluation of hand-transmitted vibration. Presented by H.-K. Jang, Institute for Advanced Engineering, Yongin, Korea

**3:30 – 3:45 PM Coffee Break**

**3:45 – 5:30 PM** **Session VII: Biodynamics II** (Chairmen: Dr. John Wu and Dr. Kumar Kittusamy)

3:45 – 4:00 A portable measurement system for the assessment of time weighted and impulsive exposures to whole body vibration. Presented by P.W. Johnson, University of Washington, Seattle, Washington, U.S.A.

4:00 – 4:15 Influence of back support conditions on the absorbed power of seated occupants under horizontal vibration. Presented by S. Mandapuram, Concordia University, Montréal, Q.C., Canada

4:15 – 4:30 A multi-body dynamic biomechanical model of a seated human exposed to vertical whole-body vibration. Presented by A. Pranesh, Concordia University, Montréal, Q.C., Canada

4:30 – 4:45 Assessments and refinements of an anthropodynamic manikin for seating dynamics applications. Presented by S.K. Patra, Concordia University, Montréal, Q.C., Canada

4:45 – 5:00 A novel 3-D hand-arm vibration test system and its preliminary evaluations. Presented by R. McCormick, MB Dynamics, Cleveland, Ohio U.S.A.

5:00 – 5:15 Multi-axis hand-arm vibration testing & simulation at the National Institute of Industrial Health, Kawasaki, Japan. Presented by T. Keller, Spectral Dynamics, Inc, San Marcos, California, U.S.A.

5:15 – 5:30 A pilot study of the transmissibility of the rat tail compared to that of the human finger. Presented by D. Welcome, National Institute for Occupational Safety and Health, Morgantown, West Virginia, U.S.A.

**6:30 PM - Banquet, Radisson Ballroom**

**Wednesday, June 7, 2006**

**8:00 – 9:30 AM Session VIII: Vibration Reduction and Machine Testing**
(Chairmen: Dr. Jack Wasserman and Mr. Alan Mayton)

8:00 – 8:15 Seat cushion and posture effects in military propeller aircraft vibration environments. Presented by S.D. Smith, Air Force Research Laboratory, Wright-Patterson AFB, Dayton, Ohio, U.S.A.

8:15 – 8:30 Comparison of anti-vibration interventions for use with fastening tools in metal. Presented by A.M. Dale, Washington University School of Medicine, St. Louis, Missouri, U.S.A.

8:30 – 8:45 Vibration control on hand-held industrial power tools. Presented by L. Skogsberg, Atlas Copco Tools & Assembly Systems, Stockholm Sweden

8:45 – 9:00 Vibration emission measurement methods for grinders. Presented by M. Persson, Atlas Copco Tools & Assembly Systems, Stockholm Sweden

9:00 – 9:15 Computational simulation of a pneumatic chipping hammer. Presented by R. Kadam, Virginia Tech University, Blacksburg, Virginia, U.S.A.

9:15 – 9:30 Design of a test bench to evaluate the vibration emission values of jackleg rock drills. Presented by P. Marcotte, Institut de Recherche Robert-Sauvé en Santé et en Sécurité du Travail, Montréal, Q.C., Canada

**9:30 – 9:50 AM Coffee Break**

**9:50 – 11:20 AM** **Session IX: Epidemiology, Standards Applications and Prevention II** (Chairmen: Dr. David Wilder and Dr. Kristine Krajnak)

9:50 – 10:05 Risk assessment of hand-arm vibration by estimate, taking the example of hand-guided stone-working machines. Presented by U. Kaulbars, BG Institute for Occupational Safety (BGIA), Sankt Augustin, Germany

10:05 – 10:20 Whole-body vibration exposure and driver posture evaluation during the operation of LHD vehicles in underground mining. Presented by T. Eger, Laurentian University, Sudbury, Ontario, Canada

10:20 – 10:35 Measurement and evaluation of vibration exposure for locomotive crew members. Presented by R. Larson, Exponent, Inc.

10:35 – 10:50 Environmental effects on truck driver ISO 2631 acceleration exposure. Presented by J. Wasserman, University of Tennessee, Knoxville, Tennessee, U.S.A.

10:50 – 11:05 Evaluation of the capability of seat suspension to reduce the operator exposure to vibration in track type tractors. Presented by M.S. Contratto, Engineering Specialist, Caterpillar, Inc.

11:05 – 11:20 Musculoskeletal symptoms among operators of heavy mobile equipment. Presented by N.K. Kittusamy, National Institute for Occupational Safety and Health, Spokane, Washington, U.S.A.

**11:20 – 11:45** Closing remarks by Doug Reynolds, Ph.D., University of Las Vegas – Las Vegas, Nevada, U.S.A.

**11:45 – 11:50** Thanks (Dr. Kristine Krajnak)

**11:50** Adjourn

**1:00 – 3:00 PM** **Visit NIOSH** (vibration exposure lab and experimental biology lab) Visitors will be divided into 2 to 3 groups. The visiting for each group will take less than one hour.

**Poster Presentations** (Chairman: Dr. Kristine Krajnak)
**6:00 PM, June 5, 2006**

01 Head-trunk motion increase with arm-rest controls. Presented by D. Wilder, University of Iowa, Iowa City, Iowa, U.S.A.

02 Arm and should muscle activity are greater with steering wheel vs. seat mounted controls. Presented by L. Frey Law, University of Iowa, Iowa City, Iowa, U.S.A.

03 Evaluation of powered wheelchairs with suspension and exposure to whole-body vibration. Presented by E.J. Wolf, VA Medical Center, Pittsburgh, PA

04 Establishment of biodynamic response measurement system of hand-arm. Presented by N. Hosoya, Saitama University, Saitama, Japan.

05 Training simulators extend laboratory testing techniques for WBV analysis. Presented by J. Wasserman, University of Tennessee, Knoxville, Tennessee, U.S.A.

06 Instrumented handles for studying hand-transmitted vibration exposure. Presented by D.E. Welcome, National Institute for Occupational Safety and Health, Morgantown, West Virginia, U.S.A.

07 A novel theory: ellipse of grip force.
Presented by R.G. Dong, National Institute for Occupational Safety and Health, Morgantown, West Virginia, U.S.A.

08 Chest transmissibility characteristics during exposure to single- and combined-axis vibration. Presented by S.D. Smith, Wright-Patterson Airforce Base, Ohio, U.S.A.

09 Modeling of hand-arm vibration. Presented by A. Joshi, University of Missouri-Rolla, Rolla, Missouri, U.S.A.

10 Railroad locomotive whole-body vibration study – Vibration, shocks and seat ergonomics. Presented by E. Johanning, Occupational and Environmental Life Science, Albany, New York, U.S.A.

11 Clinical assessment and characteristics of men and women exposed to high-level of hand-arm vibration. Presented by T. Jetzer.

12 Acute effects of vibration on the rat-tail artery. Presented by D. Riley. Medical College of Milwaukee, Milwaukee, WI, U.S.A.

13 Effects of repeated vibration exposures in muscle tissue. Presented by O. Wirth. National Institute for Occupational Safety and Health, Morgantown, West Virginia, U.S.A.

14 Vibration exposure reduced nitric oxide concentrations in the ventral artery of the rat tail. Presented by C. Johnson. National Institute for Occupational Safety and Health, Morgantown, West Virginia, U.S.A.

15 Acute vibration induces oxidative stress and changes in transcription in Soft tissue of rat tail. Presented by S. Waugh. National Institute for Occupational Safety and Health, Morgantown, West Virginia, U.S.A.

16 Visualization of multi-digit manipulation mechanics, Presented by Z.-M. Li, University of Pittsburgh, Pennsylvania, PA, U.S.A.

17 A field study: Measurement and evaluation of whole body vibration for MH-60S pilots. Presented by K .Harrer, Naval Medical Center San Diego, California, U.S.A.

18 Use of TUNGSTEN to reduce vibration exposure in aircraft manufacturing. Presented by M. J. Jorgensen, Wichita State University, Wichita, KS, U.S.A.

19 Handle design for optimal hand function. Presented by Stephen L. Tillim, Bonsil Technologies, LLC, Boulder Creek, CA, U.S.A.

20 Vibration time and rest time during sinusoidal vibration experiments: Do these factors affect comfort ratings? Presented by James P. Dickey, Human Health University of Guelph, Guelph, Ontario, Canada.